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ENTOMOLOGICAL NOTES:

BY

WALTER W. FROGGATT,

GOVERNMENT ENTOMOLOGIST.

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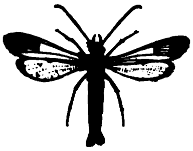

Fig. 1.

THE CURRANT CLEAR-WING MOTH.
(*Sesia tipuliformis.*)

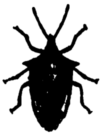

Fig. 2.

THE VINE-MOTH BUG.
(*Arma sibellanbergi*, Germ.)

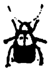

Fig. 3.

A GRAPE-DESTROYING BEETLE.
(*Monolepta diversa*, Blackb.)

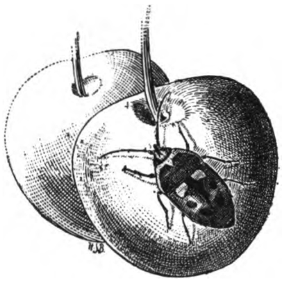

Fig. 4.

THE CHERRY BUG.
(*Peltophora picta*, Germ.)

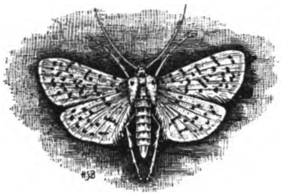

Fig. 5.

THE PEACH MOTH.
(*Conogethes punctiferalis*, Gn.)

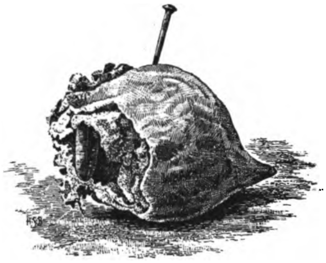

Fig. 6.

SHOWING PUPA OF PEACH MOTH IN A PEACH
DESTROYED BY THE CATERPILLAR.

FROM AGRICULTURAL GAZETTE OF N. S. WALES.

February, 1897.

Entomological Notes.

BY WALTER W. FROGGATT,
Government Entomologist.

THE CURRANT CLEAR-WING MOTH (*Sesia tipuliformis*).

THOUGH this little hawk moth was introduced into New Zealand some years ago, this is the first record of its occurrence in Australia. Early last October one specimen was obtained from a bundle of red and black currant twigs, pruned from some bushes growing in the Governor's garden at Sutton Forest.

During an official inspection by Mr. J. H. Maiden he noticed that many of the currant bushes were infested with borers, and instructed the gardener to forward some branches to the Agricultural Department for investigation. Unfortunately it was rather late in the season, and most of them had emerged, while many of the branches had been cut off too short and the grubs left behind. However, enough specimens of living larvæ and pupæ were cut out to complete their life history.

This has been a well-known pest to currant growers for many years in England. Miss Ormerod says that the eggs are laid early in the summer in some crack or crevice upon the bark, from whence the little grub gnaws its way into the central pith of the twig, remaining in the pupal state until the following March. The branches examined had the centre tunnelled out, at the end of which was found the caterpillar or pupa; many of the tunnels extended for several feet, and eventually caused the branch to wither and die.

The caterpillar is a dull white creature about half an inch in length, with a dark brownish head rounded and slightly lobed, the legs short and cylindrical, and the segments of the body distinct but narrow.

The pupa measures about 5 lines in length. The basal portion is dark brown, the rest much lighter in colour; the apical edge of each of the abdominal segments upon the dorsal surface fringed with fine spines, and the tip of the abdomen carrying several angular protuberances.

The moth measures 9 lines across the wings and 5½ lines from the head to the tip of the abdomen. The antennæ are thick, the eyes fringed with fine yellow hairs, and the body long and slender, thickly covered and fringed at the tip with a flat hair-like brush of long scales. The wings, as its name implies, are transparent with the nervures, a band at the tips, and a slender one behind, which curves round to the tip, thus enclosing an oval transparent patch on the fore wings, and a fine line of black scales along the hind wings. As we have no native hawk moth like this species with its distinct black colouration and variegated wings, it will be easily recognised when met with among the currant bushes, and it is not known to attack anything else.

The best preventive for the spread of this moth is for all growers to prune off any branches that look sickly, and if they are found to be attacked by borers to be sure to cut them off so that the grubs are not left behind, and burn them. A great many pests are bred from pruned branches and dead trees that should always be destroyed, for as soon as decay sets in, many insects, particularly wood-boring beetles, are attracted, either to feed upon the withering bark or to lay their eggs in the wood.

As we know that the moth emerges early in October, growers can be on the look out for them at that time, and keep them in check. (See Plate, fig. 1.)

AN INSECT ENEMY (*Arma silbellanbergi* Gérmer.) OF THE VINE MOTH (*Agarista glycine*, Lewin).

THE first information I received as to the beneficial habits of this active little plant bug, was from a correspondent some three years ago, who when sending some specimens for indentification informed me that they had cleared his orchard of the larvæ of the fig-leaf beetle (*Galeruca semipullata*, Clark), which threatened at one time to strip every leaf off his fig-trees.

Since then this bug has turned its attention to the caterpillars of the vine moth which within the last few years have increased with such rapidity in our vineyards that they are one of the most serious insect pests our vignerons have to cope with; and this is mainly accounted for by the fact that from some acrid taste or their hairy covering no birds, with the exception of two of our cuckoos, which unfortunately are rather scarce birds, will touch them. I have frequently taken a handful of these caterpillars and thrown them in the fowlyard, but the moment the fowls pecked at them they turned away in disgust, and would have nothing further to do with them.

Mr. Musson writing from the Hawkesbury Agricultural College says, "Could you give me the name of this bug we have noticed in our garden for the last two seasons destroying the vine moth caterpillars."

Mr. J. Sherack of Minto says that a great number of their eggs were noticed upon the leaves of the vines, and that a number were destroyed under the impression that they were the eggs of the moth, until the young bugs were observed emerging from them, and since then the bugs have increased in numbers and usefulness every season.

At least a dozen other correspondents have sent in specimens of this bug with notes on its beneficial habits, and as these have come from all parts of the country it is evident that it is increasing in numbers and activity, and in time to come may prove to be a very important ally of our gardeners. The Vine-bug (*Arma silbellanbergi*) belongs to the order Hemiptera, and the Family *Scutelleridæ*, so many members of which are destructive to fruit, sucking up the juices in the same manner that this one attacks the caterpillars.

It measures half an inch from the tip of the head to the end of the body, and is of a general greyish-brown colour, with the whole of the upper surface thickly interspersed with light yellow spots, which gives it a rather mottled appearance; the margins of the prothorax and the scutellum also light yellow. The snout comes to a sharp point, with the sides of the prothorax running out into angular spines, giving the head and thorax combined a triangular appearance; the sides of each abdominal segment are marked with black, all the under surface and legs yellow, and both the upper and under surface covered with fine impressed punctures, with the exception of the membraneous tips of the wings which fold over each other. The eggs are laid side by side upon the leaves, forming a patch of from a dozen to thirty; these eggs are round and semi-transparent with a curious cap-like covering on the top with raised points forming a fringe right round; they are very pretty objects when viewed with a lens, and with the curious lid and shining transparent shell cannot be easily mistaken for the moth's eggs. (See Plate, fig. 2.)

THE VINE MOTH.

IN the county of Cumberland the first crop of caterpillars were very numerous and destructive in October and November, not only eating the foliage but also, in many instances, the young grapes. These caterpillars which reached maturity formed their cocoons, and emerged as perfect moths in February, the caterpillars from their eggs forming the second brood which strip the vines after the grapes are gathered.

The full grown caterpillars of the October or Spring brood crawl down the vine and form great numbers of their loose silken cocoons covered with a coating of sand round the stem of the vine just above the surface, or more frequently round the vine stake, often clustered together like the cells of a mud wasp nest; the remainder burying themselves beneath the surface of the soil.

This would be the time for the vignerons to take action, for every chrysalid destroyed would mean the death of a moth, and every pair of moths would mean the destruction of the unlaid eggs.

Several of our correspondents have suggested methods of trapping the moths, and some, under the impression that they are like butterflies always flittering about on the look out for sweet things, have proposed erecting among the vines sugared boards, against which the moths would fly and be destroyed; but the vine moths are not particularly fond of sweets. Their first mission in life is to deposit their eggs, and until this is accomplished they would not be led astray by sugared traps, and after the eggs were laid it would be very little satisfaction to catch them.

The simplest and most effective method of destroying the caterpillar is by spraying the foliage of the vines with Paris Green, in proportion of one pound of Paris Green to 100 gallons of water, or when making small quantities, a quarter of an ounce to two gallons of water; the proportion of Paris Green can be increased if not found effective. The vines should not be sprayed in the hot sunshine but in the early morning or evening, or in cloudy weather, otherwise the foliage may be burnt.

I should strongly advise a good spraying for the summer caterpillars, as from their chrysalids come the moths that lay the eggs, from which come the spring brood that do the damage when the young grapes are forming and the vine needs all her wealth of foliage.

Those persons who hand-pick the caterpillars in a vineyard can never expect to clear their vines, as every time they go over them the smaller caterpillars, upon which the Paris Green acts most rapidly, are left behind, and the expense of spraying with this poison, even several times in the season, is not to be compared with employing labour to hand-pick them. There is not the least doubt that united action on the part of the vine-growers would soon keep this at present very serious pest within bounds.

A GRAPE-DESTROYING BEETLE (*Monolepta diversa*, Blackb.).

IN its native state, this small *Chrysomalid* beetle is found upon the flowers of the dwarf angophora, one of our small "apple-tree" gums, the flowers of which are sought after by so many insects in the early summer. A number of specimens were received from Mr. H. Doherty, of "Harefield," Grenfell, with the information that they were found attacking the young grapes just as they were setting, and causing a great deal of damage.

They were afterwards observed upon the peach trees, gnawing the foliage and forming little brown lumps upon the tips of the leaves.

Upon the examination of some of these lumps forwarded with the beetles, they were found to consist of a gummy capsule covering a slender yellow egg.

This beetle has the typical form of the genus *Monolepta*, which contains a number of well-known plant-eating beetles; this is one of the smaller ones, hardly more than one-twelfth of an inch in length, having the eyes, antennæ, tarsi, and apical half of the wing cases black, the rest orange-yellow. The best plan to get rid of these beetles when the vines cannot be sprayed is to shake them gently on to a sheet spread below; if this were done early in the morning when the insects were sluggish, most of them would fall and could be destroyed.

When upon the foliage of the peach trees, a weak spray of kerosene emulsion would destroy both eggs and beetles. (See Plate, fig. 3.)

THE LEAF CASE MOTH (*Thridopteryx hubnerii*, Westwood).

IN the early summer months, one often comes across a eucalyptus bush with its foliage fairly riddled by the young caterpillars of this case moth, which is one of the most plentiful species about Sydney. Each caterpillar is covered with its conical little cap, and moves about in a very comical manner by means of its protruded legs while it gnaws the upper surface of the leaf. Lift up one of these caps and you will find that it is a little silken funnel covered with woody dust and minute particles of the leaves, covering a dark-brown grub, just like many other little caterpillars; but some remote ancestor, probably finding his hairless, smooth, body was a tempting morsel for prehistoric birds or insect enemies, evolved a covering, and his descendants have profited by his example. By some means, however, both flies and wasps manage to lay their eggs upon the caterpillars; fully 90 per cent. never get beyond the chrysalid state, and it is very difficult to obtain good specimens of the males of any of the case moths. The life history of several of our case moths is very well known, but as some of our many readers may not know their habits, the following notes are given. The female insect, which constructs a cocoon exactly like the male, never leaves her case or becomes a perfect winged moth; she reaches a certain size and undergoes an incomplete metamorphosis with her last moult, and is impregnated by the male moth from a hole at the base of the case, from which, in due course, emerge living young, each with a little thread to launch itself on the foliage. When keeping the cocoons, one often finds the box swarming with these little creatures hanging in long black strings from the maternal case. As soon as they find themselves on their food they set to work to cover themselves, and are not particular what the material is. I once kept some upon a sheet of red blotting-paper, and afterwards removed them to a sheet of blue, so they had first a red cap and then a basal ring of blue.

The male chrysalid, on the other hand, changes into a most active, perfectly-developed moth; but before the caterpillar changes, it turns round in its case after it has securely fastened it at the top to a twig, and pupates so that the head is turned down to the tip of the cocoon, from which it can easily make its exit. This moth is seldom met with, for as soon as he escapes he dashes off in a most reckless manner, hunting about for his mate, and his life is short.

It is in the larval state that these moths do the damage to cultivated plants, and of late years they seem to have developed a taste for a very varied diet.

In December Messrs. Searl and Sons sent me a number of the young cases with the information that they were very destructive to the foliage of chrysanthemums in their gardens at Botany.

Mr. Gorus, of this department, a few weeks later sent a bunch of young grapes and foliage from a vineyard at Seven Hills covered with small cases, the occupants of which were feasting upon both grapes and leaves.

Mr. W. Moseley, of Parramatta, brought me some very pretty cases covered with fragments of oak leaves, and informed me that a large English oak tree growing in his garden was so thickly covered with them that they threatened to completely defoliate it in a very short time, if not destroyed.

When small, and particularly when feeding upon small trees or plants, a good spraying with Paris Green, from about 1 lb. to 100 gallons of water, would soon clear them out; while collecting all the large, full-grown cases and destroying them before the larvæ emerge would save a lot of future work where they are plentiful.

THE ELEPHANT BEETLE (*Orthorrhinus cylindrirostis*, Fab.).

ABOUT the end of last December a number of these beetles were found upon an apple tree in my garden at Croydon, my attention being first called to their presence by noticing that a great deal of the bark upon the young wood was gnawed off in irregular patches, sometimes nearly right round the twig. Upon examining the tree closely for the cause, about a dozen of these long-legged weevils were found clinging so closely to the branch while they were gnawing at the bark that, in spite of their large size, they could be easily overlooked.

For the next fortnight I found one or two nearly every day, and then the supply ran out. As they are strong-flying beetles they probably found their way over from the bush paddocks of Abbotsford or Five Dock.

In their native state they show a marked preference for freshly-fallen timber when the bark is just beginning to wither, and I have often found them upon a freshly-cut rail or log before it has been barked; if there are any about the neighbourhood they seem to find them very quickly. Some specimens kept in a building-case gnawed most of the bark off a branch placed in with them, and upon the 8th of January one was observed to be clasping the twig with the middle and hind legs, with the long forelegs and head hanging downwards moving the tip of the abdomen, which was closely pressed against the bark. When examined next day a small circular pin-hole about half a line in depth was found, at the bottom of which was a single bright yellow rounded egg.

When the trees are small hand-picking would be the simplest method of clearing out these beetles, as once their presence is noted they are easily found; upon large trees a spraying of Paris Green would destroy them.

In Vol. I of the *Agricultural Gazette*, N.S.W., 1890, the late Mr. A. S. Olliff gave an interesting account of this beetle, illustrated with a plate; but in that paper it was their larvæ that were boring into the wood of the orange trees that was noticed, and not the perfect beetles, as in this case.

THE CHERRY BUG (*Peltophora picta*, Germ.)

ABOUT the end of December, Mr. G. E. Griffiths, of Rocky River, sent in several specimens of this handsome shield bug, which he stated was doing a great deal of damage to his cherry crop.

They were swarming over the trees, and attacked the ripe fruit by piercing the skin with their sharp beak and sucking up the juice, causing the cherries to rot and fall.

When alive the general colour is rich metallic green, but dried specimens fade into a bluish duller tint; the sides and front margin of the thorax, with two broad spots on the shoulders, and the under surface red; upon the wing cases are two dull blackish marks on either side; the legs are variegated, the basal half of the thighs and tibiæ red, the rest metallic green, with markings of the latter colours along the edge of the abdominal segments. The back is rounded, the head small, with the thorax coming to a point in front; the thorax and abdomen tapering to a rounded tip. This bug has a wide range over the northern parts of New South Wales and southern Queensland, while further north its place is taken by another species of the same genus which I have seen in thousands feeding upon the wild figs upon the banks of the Burdekin River.

It would be difficult to catch these plant bugs with a spray without spoiling the ripe fruit; the best method to deal with them then would be to shake each bunch over a shallow dish containing kerosene and water, or spread a sheet under the tree and shake the lot down, killing them afterwards. (See Plate, fig. 4.)

THE PEACH MOTH (*Conogethes punctiferalis*, Gn.)

SEVERAL chrysalids of this handsome little moth, together with the fruit attacked, were forwarded by Mr. R. Stobo, of Miller's Point, who received them from Mr. Alexander Campbell, Wooroowoolga Station, Casino, N.S.W.

I have never seen the caterpillars, but from the peaches received their method of attack is as follows:—They enter the green unripe peach close to the stalk and feed upon the fleshy part, gradually eating it all out right round the stone; gnaw out a small chamber in the side of the stone, line it with a silken web, and pupate. The chrysalids were received upon the 8th of December, and two moths emerged upon the 18th of the same month.

The moth measures about an inch across the expanded wings, is of a general bright yellow colour thickly mottled with fine black spots that form a number of somewhat irregular transverse lines towards the tips, but are more irregular near the body, which, as well as the thorax, is also spotted.

The presence of the grubs in the peaches can be detected by the gnawed hole and mass of castings loosely hanging together in a silken web round the opening. As soon as a withered peach is noticed it should be pulled off and destroyed, so that the caterpillars would not have a chance of turning into moths.

The caterpillars feeding inside the peaches could not be destroyed with any kind of spray. (See Plate, figs. 5 and 6.)

[One plate.]

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